Actual Case Histories
(These are NOT Made-Up)

Michigan DEQ VI Training

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HARTMAN
ENVIRONMENTAL GEOSCIENCE

The Most Important Ingredient

Experience:

- Consultant
- Collector – done soil gas before?
- Lab – certified for methods?
- Regulator
- Public
- YOU!

What level person is going in the houses?

The Most Common Goof

1 ug/L Benzene equals:

a) 1 ppbv
b) 1 ppmv
c) 330 ppbv
d) None of the Above

Most Common VI Bloopers

- Unit Confusion
  - Assuming ug/L equivalent to ppbv
  - Assuming ug/m3 equivalent to ppbv
- Screening Levels
  - Comparing to generic screening levels
  - Not calculating correct levels
- Sampling & Analysis Errors
  - Program design: soil gas? GW? SS? IA?
  - Using wrong hardware
  - Using wrong analysis

HARTMAN
ENVIRONMENTAL GEOSCIENCE

Indoor air SLs

SG Samples

Sample ID		TPH	Benzene	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	MTBE mg/L
Residential Land Use ESL ((Shallow Soil Gas)	NA	10.0	0.084	63.0	0.98	21.0	9.4
SG1	11/10/2009	<0.25	<0.05	<0.05	<0.05	<0.05	NT
	10/1/2010	NT	<0.005	<0.005	<0.005	<0.005	<0.005
SG2	11/10/2009	<0.25	<0.05	<0.05	<0.05	<0.05	NT
	10/1/2010	NT	<0.005	<0.005	<0.005	<0.005	<0.005
SS1	11/10/2009	<0.25	<0.05	<0.05	<0.05	[illegible]	NT
	10/1/2010	NT	<0.005	<0.005	<0.005	<0.005	<0.005

Notes

<###	Below Laboratory Method Detection Limit
mg/L	Milligram per liter
MTBE	Methyl *tertiary* butyl eth
NA	Not applicable
NT	Analyte not tested
TPHg	Total Petroleum Hydrocarbons as gasoline

Consultant's Report

Lab Report

Units: ppmv

[illegible]ICAL & ENV[illegible]BORATORIES, INC.

ANALYTICAL REPORT

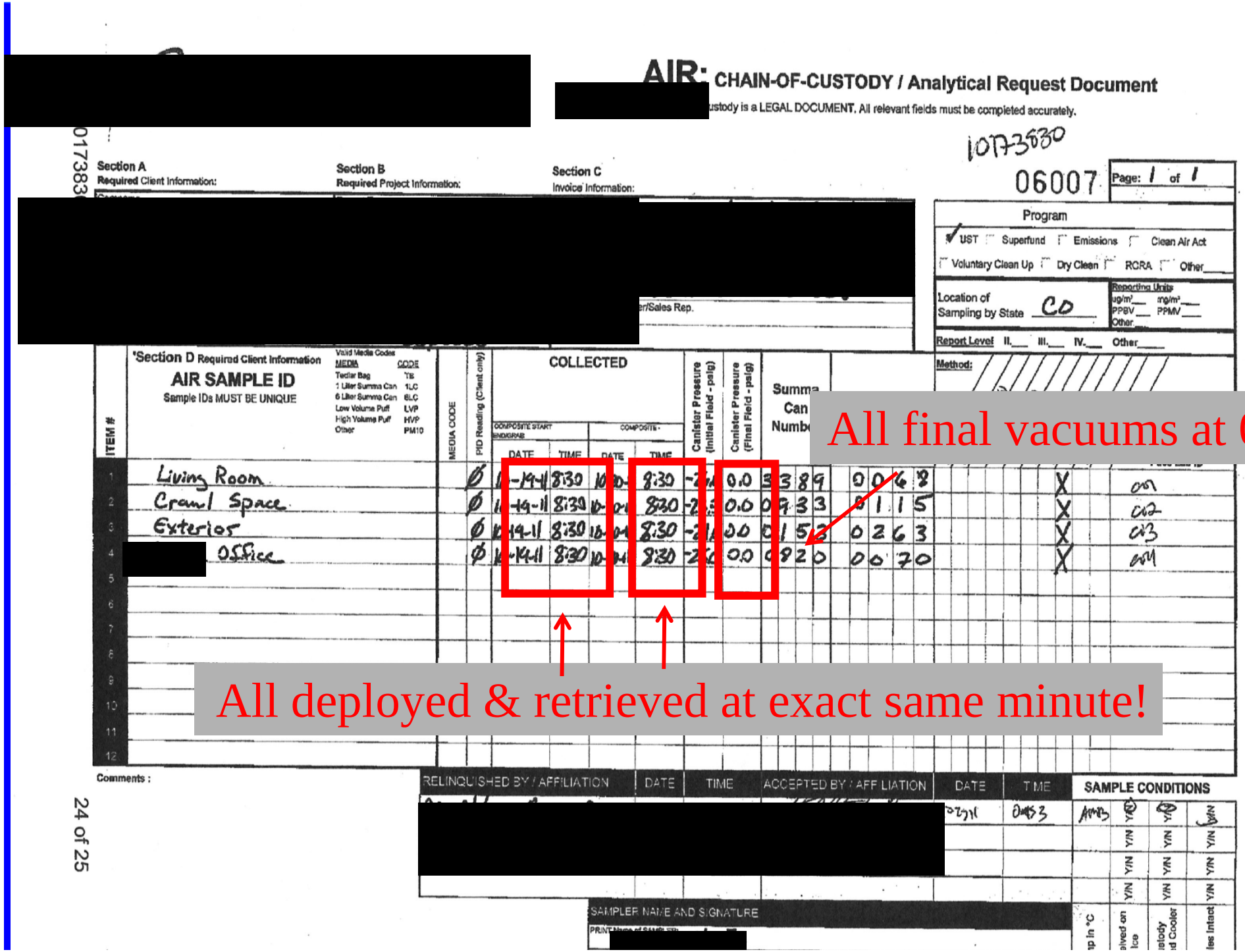
--- VOLATILE ORGANICS BY EPA TO-15 (GC/MS) ---

Client Nam[illegible]
Project Nam[illegible]e :
Matrix : Air
Unit: ppm v

Date Sampled :
Date Received :
Date Analyzed :
Date Reported :

SAMPLE ID	SS Closet					
C&E LAB ID						
DILUTION FACTOR	1	1	1			
1,2,4-Trimethylbenzene	ND	ND	ND		0.005	0.01
1,3-Dichlorobenzene	ND	ND	ND		0.005	0.01
1,4-Dichlorobenzene	ND	ND	ND		0.005	0.01
[illegible]	ND	ND	ND		0.005	0.01

These values brought up into top tabl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Program
UST Superfund Emissions Clean Air Act
Voluntary Clean Up Dry Clean RCRA Other
Location of Sampling by State CO
Reporting Units
Report Level II. III. IV. Other
Method:
Section A Required Client Information:
Section B Required Project Information:
Section C Invoice Information:
Section D Required Client Information
AIR SAMPLE ID
Sample IDs MUST BE UNIQUE
Valid Media Codes
MEDIA CODE
Tedlar Bag TB
1 Liter Summa Can 1LC
6 Liter Summa Can 6LC
Low Volume Puff LVP
High Volume Puff HVP
Other PM10
ITEM #
MEDIA CODE
PID Reading (Client only)
COLLECTED
COMPOSITE START
COMPOSITE END/GRAB
DATE
TIME
Canister Pressure (Initial Field - psig)
Canister Pressure (Final Field - psig)
Summa Can Numb
1 Living Room
2 Crawl Space
3 Exterior
4 [redacted] Office
All final vacuums at 0
All deployed & retrieved at exact same minute!
Comments :
RELINQUISHED BY / AFFILIATION
DATE
TIME
ACCEPTED BY / AFFILIATION
DATE
TIME
SAMPLE CONDITIONS
SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:

Reported: 04/15/2011 15:13

CAT No.	Analysis Name	CAS Number	As Received Final Result		MDL	As Rece: Final Re
Volatiles in Air	**ASTM D1946**		%		%	
[illegible]	[illegible] Dioxide	124-38-9	< 0.060		0.060	
00034	Oxygen	7782-44-7	7.5		0.060	
Volatiles in Air	**EPA 18 modified**		mg/m3		mg/m3	ppm(v)
11687	Butane	106-97-8	< 3.6		3.6	< 1.5
07056	Methane	74-82-8	85		3.9	130
Volatiles in Air	**EPA TO-15**		ug/m3		ug/m3	ppb(v)
05298	Acetone	67-64-1	68		12	29
05298	Acetonitrile	75-05-8	22	J	8.4	13
05298	Acrolein	107-02-8	< 11		11	< 5.0
05298	Acrylonitrile	107-13-1	< 11		11	< 5.0
05298	Benzene	71-43-2	< 6.4		6.4	< 2.0
05298	Bromobenzene	108-86-1	< 13		13	< 2.0
05298	Bromoethene	593-60-2	< 22		22	< 5.0
05298	Bromoform	75-25-2	< 21		21	< 2.0
05298	Bromomethane	74-83-9	< 7.8		7.8	< 2.0
05298	1,3-Butadiene	106-99-0	< 11		11	< 5.0
05298	2-Butanone	78-93-3	< 15		15	< 5.0
05298	tert-Butyl Alcohol	75-65-0	< 15		15	< 5.0
05298	n-Butylbenzene	104-51-8	< 11		11	< 2.0
05298	sec-Butylbenzene	135-98-8	< 11		11	< 2.0
05298	tert-Butylbenzene	98-06-6	< 11		11	< 2.0
05298	Carbon Disulfide	75-15-0	< 6.2		6.2	< 2.0
05298	Carbon Tetrachloride	56-23-5	< 13		13	< 2.0
05298	Chlorobenzene	108-90-7	< 9.2		9.2	< 2.0
05298	Chlorodifluoromethane	75-45-6	< 7.1		7.1	< 2.0
05298	Chloroethane	75-00-3	< 5.3		5.3	< 2.0
05298	Chloroform	67-66-3	< 9.8		9.8	< 2.0
05298	Chloromethane	74-87-3	< 4.1		4.1	

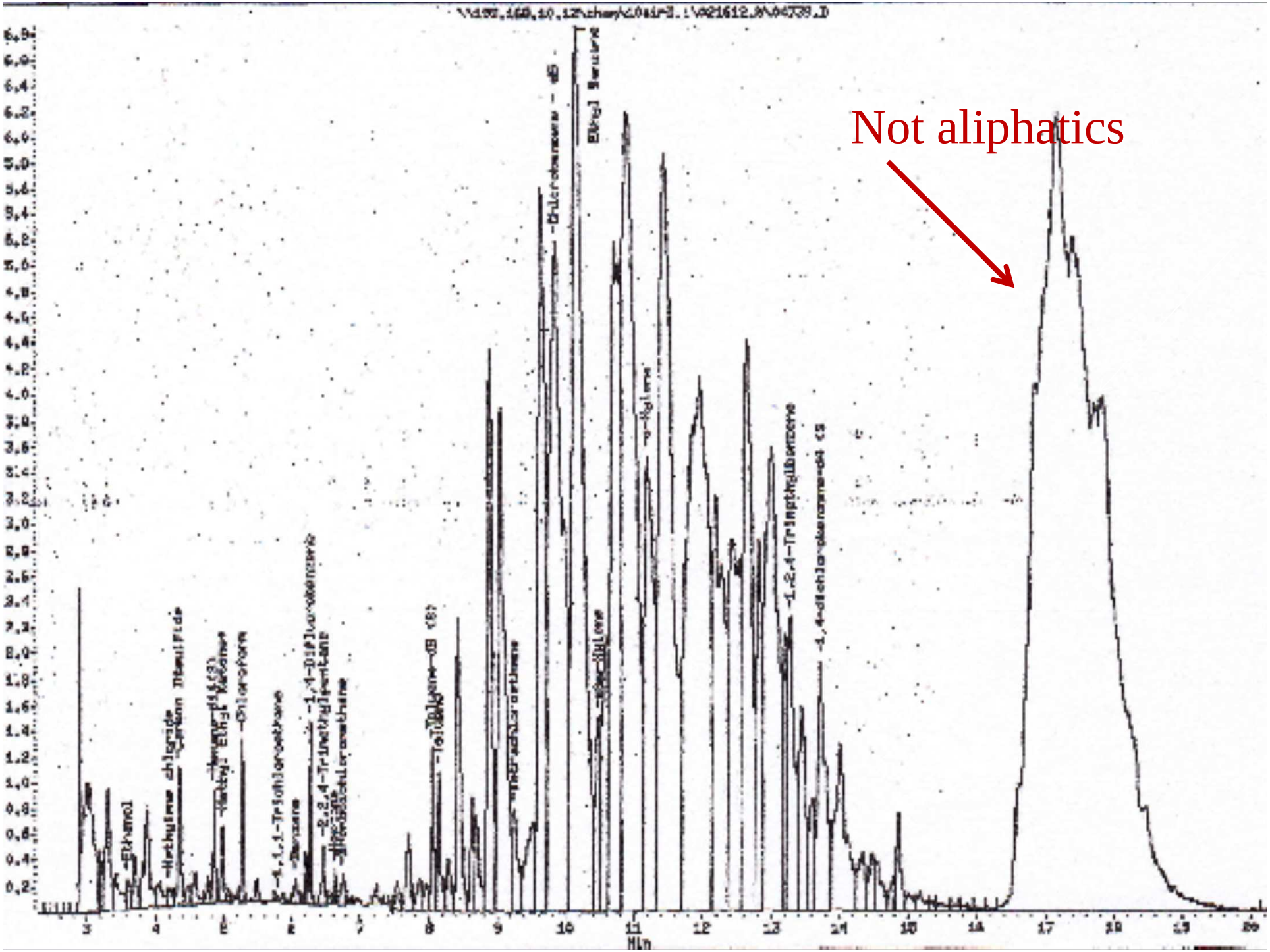
O2=7.5%

Location	Near DWSS	to VP-1	VP-4	fence post	corner	garage	DWSS
Summa size (litres)	6	6	6	6	6	6	6
Summa ID	832/4505	109	535/1291	822/4548	198	114	107
Flow Controller ID	7329537	7336786	7301041	7252153	7234843	7336758	7336759
Summa Flow regulator setting (time)	24hr intake	24hr intake	24hr intake	24hr intake	24hr intake	24hr intake	24hr intake
Total single implant volume (litres)	0.191	NA	NA	NA	NA	NA	NA
Purge Time Start	11:12	NA	NA	NA	NA	NA	NA
Purge Time Stop	11:17	NA	NA	NA	NA	NA	NA
Total purge time (mins.)	5	NA	NA	NA	NA	NA	NA
Volume purged (litres)	1	NA	NA	NA	NA	NA	NA
Tracer Gas Reading - Initial (%)	0.6400%	NA	NA	NA	NA	NA	NA
Pressure gauge pre-sample (inches Hg)	-29	>-30	-30	>-30	-29	>-30	-28.5
Sample start time	13:57	14:34	14:26	14:22	14:10	13:55	13:56
Sample end time	10:12	12:58	11:41	11:16	11:55	10:40	10:15
Elapsed sample time (mins.)	1215	1344	1275	1254	1305	1245	1219
Pressure gauge post-sample (inches Hg)	-12	-10	-12	-21	-9	-21	-11
Tracer gas reading - Final	0.5000%	NA	NA	NA	NA	NA	NA
PID reading (ppm)	0	0	0	0	0	0	0

The cans only filled partially!

Soil Gas TPH Data

Location	Compounds ($\mu g/m^3$)		C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics	Oxygen in purge gas, field measurement
	Residential SSSLs		313	52	104	
	Sample Date	Sample Depth (feet)				
SGP-2	2/9/2012	23	**34,000 J[3]**	**239,000 J[3]**	**583**	8.5
Lab A	2/9/2012	Duplicate	**53,800 J[3]**	**345,000 J[3]**	**518**	8.5
Lab B	12/12/2012	23	**150**	ND<47	ND<12	2.7


Not aliphatics